Amendments to the Claims:

Re-write the claims as set forth below. This listing of claims will replace all prior versions and listings, of claims in the application:

Listing of Claims:

1.   (Currently amended) In a graphics processing circuit, a method for calculating an output value of a function based on an input value, wherein the input value comprises an input mantissa and an input exponent, the input mantissa further comprising a first portion and a second portion, and wherein the output value comprises an output mantissa and an output exponent, the method comprising:

provides a point value stored in memory based on the first portion of the input mantissa;

providing at least one slope value stored in memory based on the first portion of the input mantissa, wherein each of the at least one slope value is based on a LaGrange polynomial approximation of the function; and

combining, using a combining circuit, the point value, the at least one slope value and the second portion of the input mantissa to provide the output mantissa.

2.   (Original) The method of claim 1, further comprising a step of:

converting the input value such that the input mantissa is within a predefined range.

3.   (Original) The method of claim 1, wherein the function is any function selected from a group comprising: a reciprocal function, a reciprocal square root function, an exponential function and a logarithm function.

4.   (Original) The method of claim 1, wherein the step of combining further comprises calculating the output mantissa according to:

$$\hat{f}(x) = f(x_0) + \sum_{i=1}^{N} a_i (\Delta x)^i$$

where: $\hat{f}(x)$ is the output mantissa;

x_0 is a value of the first portion of the input mantissa;

$f(x_0)$ is the point value;

Δx is a value of the second portion of the input mantissa;

a_i is an i'th slope value of the at least one slope value; and

N is an order of the LaGrange polynomial approximation of the function.

5.   (Original) The method of claim 4, wherein N = 3 and the LaGrange polynomial approximation of the function comprises a third-order LaGrange polynomial approximation of the function.

6.   (Original) The method of claim 4, further comprising steps of:

deriving the at least one slope value, a_i, by factoring the LaGrange polynomial approximation of the function by $(\Delta x)^i$.

7.   (Original) The method of claim 1, further comprising steps of:

processing the input exponent according to the function to provide the output exponent; and

combining the output mantissa and the output exponent to provide the output value.

8.   (Currently amended) An apparatus for calculating an output value of a function based on an input value, wherein the input value comprises an input mantissa and an input exponent, the input mantissa further comprising a first portion and a second portion, and

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wherein the output value comprises an output mantissa and an output exponent, the apparatus comprising:

memory containing a plurality of point values and a plurality of slope values;

means for providing a point value stored in the memory based on the first portion of the input mantissa;

means for providing at least one slope value stored in the memory based on the first portion of the input mantissa, wherein each of the at least one slope value is based on a LaGrange polynomial approximation of the function; and

means, coupled to the means for providing the point value and to the means for providing the at least one slope value, for combining the point value, the at least one slope value and the second portion of the input mantissa to provide the output mantissa.

9.   (Original) The apparatus of claim 8, further comprising:

means, coupled to the means for providing the point value and the means for providing the at least one slope value, for converting the input value such that the input mantissa is within a predefined range.

10.   (Original) The apparatus of claim 8, wherein the function is any function selected from a group comprising: a reciprocal function, a reciprocal square root function, an exponential function and a logarithm function.

11.   (Original) The apparatus of claim 8, wherein the means for combining further comprises calculating the output mantissa according to:

$$\hat{f}(x) = f(x_0) + \sum_{i=1}^{N} a_i (\Delta x)^i$$

where: $\hat{f}(x)$ is the output mantissa;

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x_0 is a value of the first portion of the input mantissa;

$f(x_0)$ is the point value;

Δx is a value of the second portion of the input mantissa;

a_i is an i'th slope value of the at least one slope value; and

N is an order of the LaGrange polynomial approximation of the function.

12.   (Original)   The apparatus of claim 11, wherein N = 3 and the LaGrange polynomial approximation of the function comprises a third-order LaGrange polynomial approximation of the function.

13.   (Currently amended)   The apparatus of claim [[1]] 8, further comprising :

means for processing the input exponent according to the function to provide the output exponent; and

means, coupled to the means for combining to provide the output mantissa and coupled to the means for processing the input exponent, for combining the output mantissa and the output exponent to provide the output value.

14.   (Currently amended)   A graphics processing circuit for calculating an output value of a function based on an input value, wherein the input value comprises an input mantissa and an input exponent, the input mantissa further comprising a first portion and a second portion, and wherein the output value comprises an output mantissa and an output exponent, the graphics processing circuit comprising:[[:]]

a point value table that provides a point value based on the first portion of the input mantissa;

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at least one slope value table, wherein each of the at least one slope value table provides a slope value based on the first portion of the input mantissa to provide at least one slope value, wherein each of the at least one slope value is based on a LaGrange polynomial approximation of the function;

at least one multiplier that multiplies successive ones of the at least one slope value with successive powers of the second portion of the input mantissa to provide at least one slope product; and

an adder that sums the point value and the at least one slope product to provide the output mantissa.

15.   (Original) The graphics processing circuit of claim 14, further comprising an input conversion circuit, positioned to receive the input value and coupled to the point value table and the at least one slope value table, that normalizes the input value such that the input mantissa is within a predefined range.

16.   (Original) The graphics processing circuit of claim 14, further comprising an output conversion circuit, positioned to receive the output mantissa and an unbiased version of the input exponent, that converts the output mantissa and the unbiased version of the input exponent from a fixed-point to a floating-point format.

17.   (Original) The graphics processing circuit of claim 14, wherein the function is any function selected from a group comprising: a reciprocal function, a reciprocal square root function, an exponential function and a logarithm function.

18.   (Original) The graphics processing circuit of claim 14, wherein the at least one multiplier and the adder operate in conjunction to provide the output mantissa according to:

$$\hat{f}(x) = f(x_0) + \sum_{i=1}^{N} a_i (\Delta x)^i$$

where: $\hat{f}(x)$ is the output mantissa;

x_0 is a value of the first portion of the input mantissa;

$f(x_0)$ is the point value;

Δx is a value of the second portion of the input mantissa;

$a_i (\Delta x)^i$ is an i'th slope product of the at least one slope product; and

N is an order of the LaGrange polynomial approximation of the function.

19. (Original) The graphics processing circuit of claim 18, wherein N = 3 and the LaGrange polynomial approximation of the function comprises a third-order LaGrange polynomial approximation of the function.